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AUTHOR McPheeters, Harold L.
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ABSTRACT

Financing and cost factors in medical education and the effect of the many missions of a medical school on funding issues are discussed. The teaching mission of medical schools includes undergraduate medical education (preparation for the MD degree), graduate medical education (training of resident physicians), biomedical specialist education, continuing medical education, and education for other health professions. Medical school research can be categorized as basic, clinical, socioepidemiological, and related to health service, while the services medical schools provide can include general and tertiary patient care, specialized centers, consultation, and miscellaneous services such as staff development or public information programs. The cost of medical education is complex because of the blend of missions and because activities for the different areas may be carried out by the same staff persons. States often base funding on formula concepts and on the notion that the medical schools' only mission is undergraduate medical education. The complexities of medical schools and their related academic health centers often are not realized. Additional consideration is given to factors which affect medical school funding and costs: missions; sponsorship; medical schools' relationships with parent universities, academic health centers, and teaching hospitals; demographic characteristics of medical schools; and local administrative decisions. (SW)

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Factors that Influence the Financing and Cost of Medical Education

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Harold L. McPheeters, M.D.

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FOREWORD

Developments in health professions education, particularly medical education, signal a new set of difficult problems for those in charge of setting state policies in the South. In 1975, the 14 Southern states appropriated about $440 million in state tax dollars for health professions education; by 1982, the figure was approximately $1.25 billion--a rate of increase nearly double that for all other higher education.

A recent SREB publication, Health Professionals for the South: Supply and Cost Issues Needing State Attention, makes a strong case for states to take a closer look at the relationship between health professions education and soaring charges for health care in general.

This publication, which is intended for legislators and board members of state higher education agencies who may be unaware of the multiple facets of medical education, offers an overview of the many missions of a medical school and how these missions affect cost and funding issues. A third SREB publication, Trends in Medical Education in the South: Enrollments and Financing, provides extensive reference data on just how much these missions have changed in the South and in the nation. That report is intended for program and budget analysts. These three publications should be helpful as states undertake analysis of health professions education.

Dr. Harold L. McPheeters, author of this report, is director of Health and Human Services programs at SREB.

Winfred L. Godwin
President

INTRODUCTION

The high costs of medical education are a matter of great concern for state policymakers. In the past, state budget, elected, and higher education officials gave relatively little attention to the costs and funding of medical schools. It was an obviously complex area, and federal grants for medical research and reimbursements for patient care services made up such a large portion of the total funding that the state's share of financial support was relatively small compared to the rest of higher education.

However, all of this is changing. Federal capitation support for medical schools has ended. Although federal research dollars have been cut only a small amount, inflation has reduced the value of the existing grants. And the federal government and other third-party payers are tightening up reimbursements for patient care services under Medicaid and Medicare to assure that these payments are related to direct patient care costs--not the additional costs of educating physicians and other health professionals. As a result, state governments are being asked to provide increased support for medical schools at a time when state revenues are tight.

Medical education is difficult to fit into the kind of formula funding that is often used in higher education. State planners and policymakers need a better understanding of the many factors that affect the funding and cost for medical schools so that they will be better able to decide which program and budget priorities are desirable for which of their medical schools.

This publication provides a kind of "glossary"--a basic view--of the different factors that influence the funding and costs of medical schools. Dollar figures are not provided because wide variations in how these fiscal items are defined and reported in different schools and states make "average" comparisons unreliable.

VARIED MISSIONS OF MEDICAL SCHOOLS

Medical schools are complex organizations with several interrelated missions. The public tends to see medical schools solely as institutions that prepare physicians to qualify for the MD degree and to become licensed as physicians. And, budget allocations and cost figures often appear to have been constructed on the assumption that this is the sole mission of medical schools. In reality, undergraduate education is a relatively small portion of the total program of a typical medical school.

The major missions of a medical school are usually defined as: 1) teaching, 2) research, and 3) service. However, each of these has several subdivisions which are given varied emphasis in medical schools. The funds to support these different missions and the costs associated with them also vary dramatically.

Teaching

Teaching is the major responsibility of all medical schools, but it includes several components:

Undergraduate Medical Education

Undergraduate medical education is the preparation for the MD degree; these "typical students" are defined in most "per student" fiscal formulations. Nationwide there were 66,485 medical students in 1981-82.* Virtually all undergraduate students are enrolled full-time. The relatively standardized four-year curriculum includes two years of pre-clinical instruction in courses in human anatomy, physiology, bacteriology, and pharmacology, and two years of clinical instruction in medical diagnosis and treatment

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* 82nd Annual Report on Medical Education in the U.S., 1981-82," Journal of the American Medical Association, December 24/31, 1983.

in specialties, such as internal medicine, pediatrics, obstetrics, surgery, and psychiatry. Pre-clinical teaching is largely done in lectures and laboratories; clinical teaching is done in hospitals and clinics and, sometimes, in preceptorships with community physicians. Occasionally instruction takes place in special treatment facilities or nursing homes.

Graduate Medical Education (Training of Resident Physicians)

This training for specialized practice is now considered to be almost essential for any physician. Across the nation, medical schools had responsibility for teaching 47,449 residents in specialty training in 1981-82.* The average period of residency training is three years, but some of the subspecialties require five years or more of hospital-based instruction and supervised practice. The medical specialities and their training programs are classified into three groups:

1. Primary Care Specialties. These are the specialties of family practice, general practice, pediatrics, obstetrics, and general (or internal) medicine. These physicians are the first point of contact for families and patients. Most of them are community-based.

2. Secondary Care Specialties. These are the specialties of general surgery, psychiatry, otolaryngology, and the major subgroups of internal medicine, such as cardiology, gastroenterology, and endocrinology. These physicians usually receive their patients by referral from primary care practitioners. They are likely to be based in clinics or hospitals.

3. Tertiary Care Specialties. These are the highly technical specialties, such as neurosurgery, therapeutic radiology, and cardiac surgery. These physicians receive their patients almost entirely by referral. For the most part they are based in large hospitals that can provide the back-up of specialized equipment and technicians.

Biomedical Specialist Education

This is the training of specialists in the biomedical sciences to advance knowledge of the basic biomedical functioning of the body (biochemistry, physiology, biomedical

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engineering). There were 16,701 students enrolled in these programs in the nation's medical schools in 1981-82.* This training usually takes place in the pre-clinical departments of medical schools, but may also occur in clinical settings. Most of this education is graduate training leading to master's or doctoral degrees, but some is postdoctoral. Biomedical education is usually closely linked to the research program of the medical school so that biomedical science students have the opportunity to serve as researchers or research assistants while they are pursuing their graduate studies.

Continuing Medical Education

Continuing medical education is designed to provide opportunities for practicing physicians and other health professionals to keep up to date with new medical knowledge and techniques. Medical schools are expanding this mission as medical knowledge grows. Many professional associations and state licensing boards require continuing education. Most continuing medical education is largely self-supporting, that is, participating physicians pay fees to attend the courses.

Education for Other Health Professions

While not usually defined as a major teaching mission of medical schools, it is common to find that faculty also provide instruction for the education of nurses, dentists, pharmacists, and allied health professionals--especially if the training programs for these specialists are located in the same academic health center or in close proximity to the medical school.

Research

Research is the systematic development of knowledge about the causes, treatment, and prevention of illnesses. The phenomenal advances in medical treatment and prevention during the past 30 years have come overwhelmingly from research conducted in

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* 82nd Annual Report on Medical Education in the U.S., 1981-82," Journal of the American Medical Association, December 24/31, 1983.

the medical schools. It has been customary to categorize the research mission into basic and clinical research, but actually there are additional groupings:

Basic Research

This is research about the nature of physical and behavioral functioning of living organisms. It is usually conducted in the basic science departments (that is, physiology, biochemistry) of medical schools.

Clinical Research

Clinical research is oriented to learning the causes of various disorders and the diagnostic testing of specific treatment, or prevention techniques. It is most often conducted in the clinical departments of hospitals or clinics, and basic science researchers and clinicians often work together on clinical research studies.

Socio-epidemiological Research

This is research of the cultural influences or epidemiological factors causing illness. It is usually conducted in departments of community medicine or behavioral sciences. The findings from this kind of research are likely to be of particular interest to state or local health officials, and funding often comes from these sources.

Health Services Research

This is research to test the effectiveness of various programs for delivering medical care. It is done in departments of community medicine and family practice.

Services

The services rendered by medical schools to patients and families and to other agencies make up a substantial part of a medical school's mission. With the exception of specialized treatment centers, these services usually are rendered in the context of teaching of students or the school's clinical research programs. There are several categories of services:

General Patient Care Services

General patient care services make up the bulk of the services provided by medical schools. These may be services to private or public patients in hospitals and clinics under a variety of fee and contract arrangements.

Tertiary Care Patient Services

These are the highly specialized services, such as brain surgery, heart surgery, kidney transplants, and therapeutic radiology, which require specialized physicians, technicians, and special facilities and equipment. These services tend to be concentrated in hospitals affiliated with medical schools.

Services of Specialized Centers

Specialized centers, such as newborn treatment centers, cancer treatment centers, burn treatment centers, eye treatment centers, spinal injury centers, and aging centers are very likely to be associated with medical schools. They usually combine research and education along with the patient care functions, but they are primarily for specialized treatment.

Consultation Services

These are services provided to advise agencies on the management of various health problems and programs. They may involve individual case consultation, but mainly in the context of helping the agency to recognize and better manage similar cases for itself.

Miscellaneous Services

Medical school facilities are often called upon by voluntary health agencies, schools, and other organizations to give lectures or to participate in staff development or general public information programs. For the most part, these services are unpaid, unless an agency uses faculty persons frequently.

FACTORS WHICH AFFECT FUNDING AND COSTS OF MEDICAL SCHOOLS

There are many possible ways to categorize the factors that affect the sources of funding and the costs of medical schools; following are those which have special relevance to state policymakers and planners.

Factors Related to the Missions of the Schools

Perhaps the widest variations in funding and costs among medical schools are those that result from differences in the schools' missions--which may have been determined by the school's trustees and/or faculties or may have been mandated by the state legislature.

Teaching Mission

Variations in the emphasis given to the different teaching missions of medical schools are significant. Some schools, especially the newer ones, concentrate on undergraduate medical education, while the larger, well-established schools give greater emphasis to graduate education and to the training of biomedical specialists. The focus of the teaching missions also varies considerably. Some medical schools concentrate on training physicians in the primary care specialties, while others stress preparation in the secondary and tertiary specialties.

Emphasis on Undergraduate Education

An emphasis on undergraduate medical student education limits the source of funding for instruction to state appropriations and student tuition unless the school has large endowments or receives large gifts from alumni or private benefactors.

Emphasis on Graduate Medical Education

A medical school emphasizing graduate medical education has two additional options for funding: a) patient fees for services rendered by the physicians in training,

and b) stipends for the residents' salaries that are made available by hospitals and agencies, such as the Veterans Administration.

However, the sources of funding depend on the types of specialty training. The schedules of almost all medical care reimbursement plans provide relatively low fees for primary care (preventive and out-patient activities) and relatively high fees for the procedures performed by tertiary care specialists in hospitals. Because society needs more primary care practitioners, several states have made provisions for extra funds to assist medical schools in primary care residency training.

The costs of graduate medical education are generally higher than the costs of undergraduate medical education. Not only are faculty ratios higher, but the clinical faculty must be given opportunities for incomes commensurate with those of private practitioners. The costs for graduate medical education in the primary care specialties are relatively lower than those for tertiary care technologies that require elaborate equipment, hospitals, and special technicians. On balance, however, higher costs of tertiary care training are more than offset by the higher fee payments for these services. In contrast, the costs of primary care training programs are not adequately compensated by third-party payments, and so supplementary funds are needed.

The relationships between undergraduate and graduate medical education are complex. It is difficult to attract competent clinical faculty to a medical school that does not train specialty residents. In addition, many studies show that the nature and site of a physician's residency training have more to do with the kind of practice and location that the physician ultimately chooses than the undergraduate education. Thus, it is more advantageous for a state to support graduate medical education programs in the most needed primary care specialties than to concentrate on undergraduate education (which has traditionally been the major state concern). A substantial residency training

program enables a medical school to have a broader range of subspecialists on the staff to serve both undergraduate and graduate teaching needs. An undergraduate program alone is unable to support all of these subspecialists. Also, graduate medical education programs are structured so that residents provide a significant part of the day-to-day clinical supervision of the undergraduate medical students--another advantage of including both graduate and undergraduate programs in medical schools.

Across the nation's medical schools it has been estimated that approximately 27 percent of medical school expenditures go for undergraduate medical education and an additional 19 percent of expenditures are for graduate education.* However, there are wide variations between schools, depending on the relative emphasis given to each of these and other missions. It is estimated that the percentage of expenditures devoted to undergraduate medical education in the South is close to 30 percent, compared to the national average of 27 percent. This is because more of the South's medical schools are new and give relatively greater emphasis to undergraduate teaching. Estimates of medical school expenditures such as these are difficult to make because the same faculty persons are likely to be involved in the teaching of both undergraduate students and graduate students as well as in research and patient care. "Joint production" programs of this kind require somewhat arbitrary assignments of staff time and costs, and so the figures must be used cautiously.

Education of Biomedical Specialists

The extent to which a medical school engages in the education of biomedical specialists varies with the degree to which it emphasizes biomedical research. Much of the funding for these specialists comes from research grants and fellowships for career

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* E. L. Hebbeler, Trends in Medical Education in the South: Enrollments and Financing (Atlanta: Southern Regional Education Board, 1983).

research investigators from the National Institutes of Health or other federal agencies. The costs for the education of biomedical specialists are relatively high and are comparable to those for specialty graduate students in the physical sciences.

Continuing Medical Education

The funding for continuing medical education has come mainly from the registration fees of participating physicians. It is a relatively low cost item which usually generates most of its own income. However, while fees are able to cover the instructional costs, they do not generally compensate the costs of planning, evaluation, record-keeping, and the marketing to attract practicing physicians to the courses. These are modest additional costs which the school must bear.

Research Mission

Some of the older and most prestigious medical schools give major emphasis to the research mission and compete actively for federal and other research grants in order to advance medical knowledge. While many of the smaller and newer schools have relatively little research activity, a certain amount of research is essential to the teaching mission in any medical school. In most universities there is considerable pressure for faculty to conduct research and publish their findings in order to be eligible for promotion, tenure, and other forms of academic recognition. This pressure also applies to faculties of medical schools. It has been estimated that across the nation an average of 37 percent of medical school expenditures go to the research mission.*

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* E. L. Hebbeler, Trends in Medical Education in the South: Enrollments and Financing (Atlanta: Southern Regional Education Board, 1983).

Basic Science Research

Basic science research depends almost entirely on grants from federal agencies or foundations. Some states provide specific support for basic research, but most are not so precise about budget allocations. The costs for basic research are moderately high--particularly when animal laboratories and highly technical equipment are required.

Clinical Research

Clinical research also depends heavily on federal grants, but there are additional funding options--particularly from pharmaceutical firms and other health-related corporations and foundations. Also, government agencies, such as the Department of Defense and the Veterans Administration, are more willing to support clinical research studies in medical schools. State governments have also provided funding.

The costs for clinical research studies are likely to be high--especially if the studies require elaborate equipment, hospitalization in special care units, and specialized technicians. On the other hand, simple drug evaluation studies using out-patients are relatively low cost.

Socio-epidemiological Research

The funding for socio-epidemiological research is also usually from grants. Collaborative funding from state public health, mental health, or health planning agencies is often available. The costs vary greatly with the methodology. If the study requires personal examination of large numbers of persons in the community, the cost will be high. Telephone or mail surveys are less expensive, but are far less reliable.

Service Mission

The funding and costs for the complex services provided by a medical school are complex and are changing in the face of pressures for the control of health care costs.

Across the nation an average of 17 percent of medical school expenditures can be attributed to the service mission.*

Patient Care Services

The funding for patient care services comes largely from payments of fees from Medicaid, Medicare, private insurance programs, or private patients. Payment schedules for highly technological hospital-based procedures are relatively good, but for such services as counseling and educating patients about diets, medications, exercise, etc., they are generally inadequate. Some funding also comes from grants or contracts with federal or state agencies, for example, clinics for developmentally disabled persons or crippled children.

The costs of providing direct patient care in medical schools are high because the patients referred to medical schools are likely to be more severely ill and to have more complications than the patients in community hospitals. And, the teaching mission requires more special studies and treatment procedures than might be provided in another setting.

In addition, a large portion of the care rendered to patients referred to medical schools is totally unreimbursed (charity patients), or the costs exceed whatever reimbursement is provided by Medicaid or other reimbursement programs. State governments are often asked to help make up these patient care losses.

Services to Special Centers

Special centers for burn treatment, cancer, heart surgery, and neonatal treatment offer special funding considerations. Most of these centers are high cost operations because of the advanced technologies and high staff ratios required. They also serve

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* E. L. Hebbeler, Trends in Medical Education in the South: Enrollments and Financing (Atlanta: Southern Regional Education Board, 1983).

patients from a wider geographic area than the medical school usually serves and from which it usually receives support-reimbursement. A few such centers (for example, cancer and heart) receive high levels of reimbursements because of the nature of the work they do. Others (neonatal care, burn care) are poorly reimbursed; they are money losers that must have supplemental funding from the state or private sources.

Consultation and Miscellaneous Community Services

Consultation and miscellaneous community service are a minor portion of the services provided by medical schools. They are usually funded through negotiated fees or contracts from the agencies requesting the services, and are relatively low cost.

Factors Related to the Sponsorship and Relationships of Medical Schools

Sponsorship and major relationships of the schools also affect the funding and costs of medical schools.

Sponsorship

Sponsorship may be private or public.

Private Medical Schools

Private medical schools depend on relatively high tuitions and fees from students for their funding, augmented by endowments and research grants. Several of these medical schools also have associated prestigious hospitals that generate large patient fees to help offset unfunded care.

Many private schools have chosen to emphasize expensive research and graduate medical education in the secondary and tertiary care specialties, although this is not true of some of the smaller private schools.

Public Medical Schools

Public medical schools are usually state-supported. (An exception is the new Armed Forces Medical School, funded by the federal government.) The tendency has been for the states to fund medical schools on a "per undergraduate student" basis rather than to provide direct funding for graduate medical education (except for programs in family practice and other primary care specialties). Public schools usually have relatively low tuitions, and generate lower revenues from patient care fees because larger proportions of their patients are on Medicaid or are totally indigent.

Relationships

Other major dimensions of fund and cost allocations lie in the relationship between 1) parent universities and their medical schools; 2) the academic health centers and the medical schools; and 3) the major teaching hospitals and the medical schools.

Relationships with Parent Universities

Most medical schools are part of a parent university; a few are free-standing institutions. When the medical school is part of a parent university but is located in a different city or in distant part of the same city, it must provide most, or all of its own administrative and support services, including maintenance and libraries. Even when the medical school is located on the university's main campus, practices for allocating funds and costs vary. Because of these variations, cost comparisons between institutions are very unreliable.

Relationships Between Medical Schools and Academic Health Centers

In the past 20 years, most medical schools--both free-standing and university-affiliated--have been incorporated with their teaching hospital into an academic health center along with other health professions schools (dentistry, nursing, allied health, pharmacy). Academic health centers are usually administered by a vice president. Some have

only one or two health professions education programs in addition to the medical school, while others have a wide array of professional and technical training programs, all of which may share the same library, laboratories, hospitals, and even some of the same faculty.

In the academic health centers there are major variations in the ways in which funds and costs are allocated among all of the different schools and the parent university. This is another reason why cost comparisons--especially across state lines--are unreliable. Within a single state, budget analysts should be aware of these differences so they can more accurately identify the funding flow and the cost items.

Relationships with Teaching Hospitals

Another factor that significantly affects the funding and costs of medical schools is their relationships to the hospitals in which the clinical teaching and patient care takes place. Many medical schools have their own teaching hospitals, owned and operated by the university as an integral part of the academic health center. In other medical schools, the hospital teaching is done in local city-county hospitals, state charity hospitals (in Louisiana), or in an array of local hospitals. Many medical schools have affiliation agreements with local Veterans Administration hospitals. There are many variations on the funding and costing for these relationships, and so there are many variations in the figures. Most extreme are those cases in which the appropriations and costs for a university teaching hospital are allocated entirely to the medical school, in contrast to those schools in which hospital funds and costs are entirely allocated to the health care delivery system. Hospital operations involve large amounts of money--millions of dollars. Within a single state it should be possible to trace these funds and costs, but comparisons across states are problematic.

Factors Related to Demographic Characteristics of Medical Schools

Basic characteristics of the individual medical schools and the clientele they serve also affect funding and costs. These include such characteristics as geographic location, ethnic origins of the students, and size of the school.

Geographic Location

Most medical schools are in urban locations where many teaching and clinical resources are available, but some are located in smaller and geographically isolated areas. An urban location makes it more feasible for schools to use part-time or volunteer faculty from among the many medical practitioners of the city, while medical schools in smaller communities must depend on full-time salaried staff.

It is also more feasible for an urban medical school to trade off patient care services for needed resources with local hospitals and agencies. Many years ago this was a very common practice for medical schools. Of course, there are real costs involved in such swaps, but because there is no exchange of funds, these costs seldom show up on the balance sheets.

The Ethnic Origins of Students

All medical schools welcome students from all races, but some make special efforts to serve certain ethnic groups. Meharry, Morehouse, and Howard Medical Schools are all heavily oriented to serving black students.

Because many of these students require special tutoring or remedial courses to make up for deficiencies in their earlier training, there are additional costs for running these schools. The federal government has been providing significant special funding for these schools, but this funding is tenuous in the face of the pressures on the federal budget. In addition to the support needed for the operation of these schools, many of these students have a need for scholarship or loan assistance much greater than the majority of students.

Size of Schools

In medical education, as in most other endeavors, there are certain economies of scale. Because some of the newer schools are relatively small, they also have relatively high costs. This is partly because minimum numbers of qualified specialists are necessary to meet accreditation standards, and also because the costs of faculty and administration have to be allocated across a smaller number of students. Smaller schools are often able to concentrate their efforts on meeting special societal needs, such as the need for primary care practitioners in rural areas, but this usually results in higher costs per student.

Larger schools can be more efficient in their use of faculty and specialized resources, and they are likely to be more active in competing for research grants. However, larger schools focus on research and training in the secondary and tertiary care specialties rather than on the more widely needed primary care specialties. This is a special problem to be overcome.

Factors Related to Local Administrative Decisions

A number of factors that influence the funding and costing of medical schools can be linked to local administrative practices. Decisions are usually based on a complex melange of historical patterns, program commitments, political influences, organizational concerns, and economic considerations. Among them are:

Faculty/Student Ratios

Faculty/student ratios, especially in graduate medical education and biomedical science programs, vary with the amount of research and service that is expected of the medical school faculty. Often the same people carry out the training, research, and service activities. Graduate education requires higher faculty/student ratios because of the more personalized and specialized nature of instruction and supervision. While

the more highly specialized service and research programs cost more, they also bring in more funding from reimbursements and grants. The primary care specialties generate less reimbursement income and thus require extra state funding.

In newly developing and smaller medical schools the faculty/student ratio may be high because of accreditation requirements. Medical schools that provide special student learning opportunities, such as rural preceptorships, also have high faculty ratios.

Use of Volunteer and Part-Time Faculty

The extent to which medical schools make use of volunteer faculty and part-time faculty from among physicians in the local community varies, even when the schools are located in urban areas where large numbers of local physicians are available. At one time medical schools relied on volunteer and part-time physicians for most of the clinical teaching, but this is no longer possible because most local physicians are unable to maintain research and specialized teaching skills. A modern medical school requires a cadre of full-time clinical faculty to give direction to the total program. Some schools still make extensive use of community physicians for some of the more routine teaching, but other schools, for historical or political reasons, do not encourage such relationships. Volunteer and part-time staff are less costly to the medical school's operation, but they need more general supervision and organization, which entails some costs.

Faculty Practice Plan Arrangements

In the past 25 years virtually all medical schools have established clinical faculty "practice plans" to receive and disburse the fees for the clinical services full-time faculty persons provide to private patients. Sometimes there is a single plan for all clinical departments; in other cases, schools have a plan for each of the different departments. Some plans use the funds to employ technicians and other staff who cannot be employed on the regular school staff; others use the money almost exclusively to

supplement the incomes of the clinicians who provide the services. A few practice plans reimburse the schools and hospitals for the use of office space and operating rooms.

Most practice plans are independent corporations and handle funds according to policies set within their corporate structure. Like other corporations, they are reluctant to make their fiscal transactions open to outside scrutiny. However, their operations affect certain aspects of the medical schools' funding and costing, and it is essential that state budget analysts for medical education be aware of how the reimbursements received by individual schools through practice plans are managed. There are likely to be changes in practice plan policies and procedures as a result of proposed policy changes in third-party reimbursement programs, but the trends are not yet clear.

Tuitions and Fellowships

Tuitions for undergraduate medical students range from less than $1,000 per year to $19,000 per year. The private schools are generally at the higher ranges of the scale compared to the public schools, in which many of the educational costs are subsidized by the state.

A variety of fellowship/stipends are available to both bio-medical students and resident physicians in specialty training. Some come from private sources or the federal government, but many come from the states. Frequently administered by the medical schools, the fellowships and stipend funds may show up on the balance sheets as income or expenditures although they are not operating costs of the schools in the usual sense; funds marked as scholarships or loans are usually identified separately.

Sites for Teaching

The sites used for teaching also affect the funding and costs of medical schools. Some schools carry out virtually all of their teaching in their associated hospital and its clinics. Others disperse students to several different sites--sometimes in different

cities, and sometimes in the same city but to several community health centers or specialty hospitals and clinics. There are also schools that assign students and residents to preceptorships or to area health education centers in rural areas in order to provide students with learning experiences in these settings. Obviously, dispersed teaching programs have higher costs because of the need to provide faculty and supervision at several locations.

SUMMARY

Medical schools have been through a quarter century of growth and expansion in undergraduate enrollments, in graduate education of physicians for specialty practice, and in biomedical research. These expanded programs received substantial funding from both federal and state governments during a generally favorable economy.

Now the medical schools and state governments are faced with a new set of circumstances. Virtually all of the federal programs, except biomedical research, are being eliminated or curtailed--even biomedical research is receiving no increases, so that inflation is cutting into this source of funding as well. Thus, states are assuming additional responsibility for support. The economic realities require that state governments and state policymakers ask serious questions about all state appropriations. Medical education has been one of the most rapidly expanding components of most state budgets, but it has had relatively little scrutiny from state budget analysts and policymakers. In most cases, state funding has been based on formula concepts or on the notion that the only mission of a medical school is the education of undergraduate medical students. The complexities of medical schools and their related academic health centers often are not realized.

There also have been increases in tuition charges, especially in the private schools, in an effort to increase the funding from the recipients of the education, but there are limits to tuition raises. If tuitions become too high, there will be declines in enrollments, a phenomenon which is already occurring in other health professions.

The cost of medical education is complex because of the blend of missions: (a) teaching at three major levels, (b) research, and (c) patient services, and because the activities of these missions are frequently carried out as "joint products" by the

same staff persons, often at the same time and place. For example, a clinical professor making patient rounds in the hospital may very well be instructing a dozen medical students, supervising the work of a half dozen residents in specialty training, rendering care to the patients, and making and recording observations for a research study. How this professor allocates his/her time for cost analysis presents problems. The tendency has been to allocate time to those activities that are most likely to be reimbursed. In such cases, even the medical school administrators, have no clear notion of what their true costs are. The problem is further complicated by the emphasis given to the different missions in individual medical schools by their boards and by state legislatures. Cost analyses are further complicated by the variety of ways in which funds and costs are defined and reported in different institutions and states.

Several efforts have been made by the federal government and the Association of American Medical Colleges to develop a uniform system for defining and reporting medical education costs. Most have tended to be more hypothetical than operational, with several cost items showing wide variations for the same categories. Because of this, it is apparent that these figures are extremely unreliable for use in the comparative analysis of any single school's costs.

As state higher education agencies, executive budget offices, and legislative budget committees undertake an analysis of the funding and costing of medical education in their states--as they must now do--it is important that they have an understanding of the complexities of missions and programs in the medical schools. They must also have the ability to relate these cost analyses to the missions and programs that have been defined for the individual schools. It is highly likely that the missions will vary between the schools within a single state. It is not unusual for one school in a state

to have a major research and tertiary care specialty training mission while another school concentrates on preparing practitioners for primary care. The funding and costs will be very different for each of these schools.

What has been said about the costs and funding of medical schools applies to the three major missions for which medical schools are established--medical education, research, and patient care. State budget officials and policymakers must be aware that medical schools provide the state and local area with additional benefits, such as the prestige that a medical center often generates or the jobs that it furnishes for the local economy. There are no measures for establishing the costs of these benefits, but they must be considered in making overall decisions about the schools. Perhaps knowing more about the costs and funding of the basic missions will make it easier for policymakers to make the overall decisions.